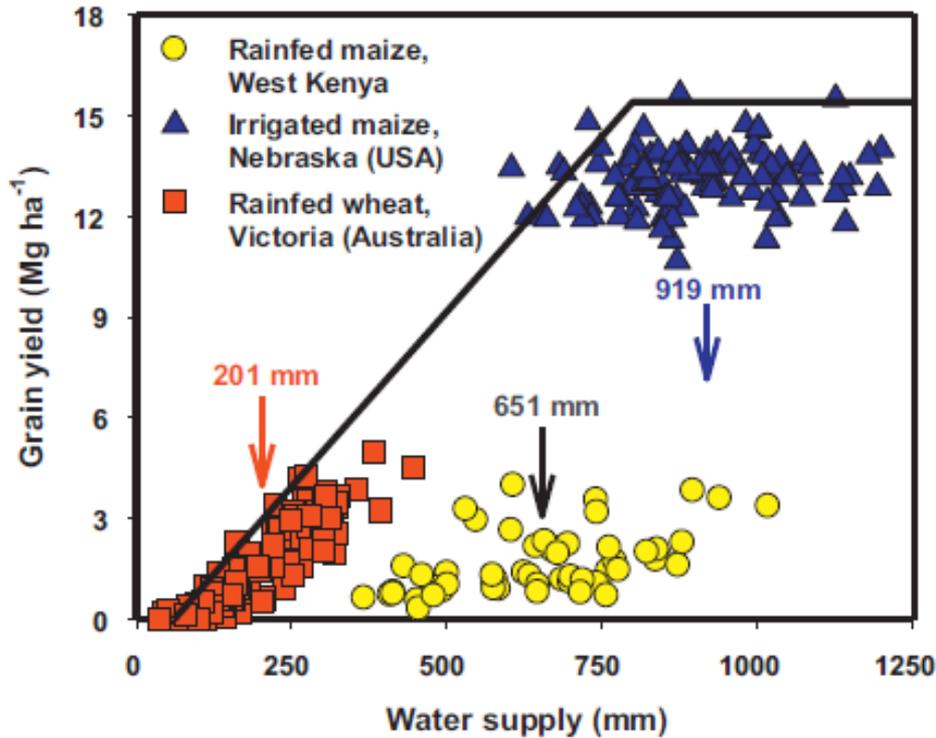


Setting Agenda for Pest and Disease Modeling in AgMIP

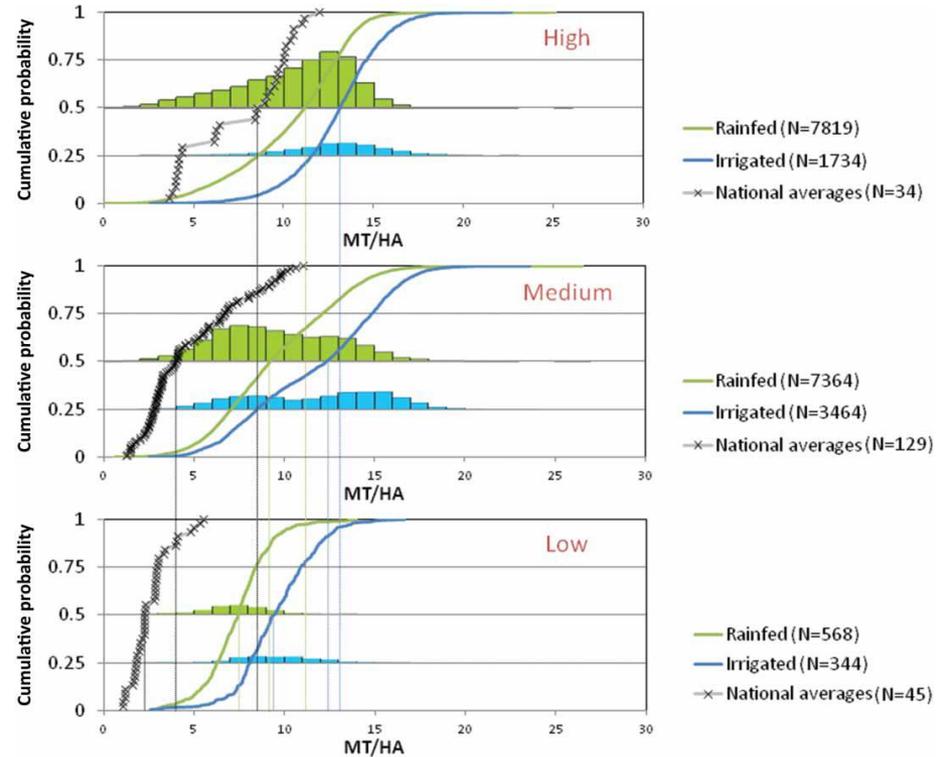
James W. Jones



Yield Gaps



From: M.K. van Ittersum et al.
Field Crops Research 143 (2013) 4–17



From: D. I. Gustafson et al. (2014)
International Journal of Agricultural Sustainability

Some Key Questions

- How much of the yield gap of crops is due to pest and disease damage?
- How does this vary over space and time for different crops?
- How can the losses to pests and diseases be avoided or reduced?
- What approaches are needed for specific regions and crops? Globally? How can we estimate benefits of different approaches (e.g., resistant varieties, crop rotations, IPM, chemicals, etc.)?
- What are expected returns on R&D investments for reducing P&D losses (public & private)
- What are the benefits regarding food security, nutrition and health?
- What are the implications on sustainability regarding water, wildlife, other natural resources?
- Many others.



This Workshop

- Agricultural System modeling is needed to help answer those questions
- The questions transcend any single discipline and are, in fact, complex including biological, physical, chemical, and social dimensions
- The questions also implicate both public and private sectors
- When AgMIP was considering this workshop, we immediately agreed that it must aim for transdisciplinary contributions

This Workshop

- Participating disciplines
 - Entomology
 - Plant pathology
 - Climate science
 - Agronomy
 - Biophysical modelers
 - Economist modelers
- Most of us are in the public sector, but several are from the private sector
- We are missing other disciplines (e.g., plant breeding, etc.), so there will be a need for others

This Workshop

- Although we know that any single workshop cannot answer all of these broad questions, we want this first AgMIP P&D workshop to lay the foundation for advancing the science toward answers and to help mobilize experts to take a giant step forward
- We were pleased at the response; most of our invitations were accepted and we had others learn about it and ask to attend
- Here, we have limited the topics to pests and diseases of crops as well as crop responses, climate interactions and socio-economic implications

This Workshop

- You will hear from each of these disciplines with their perspectives on pest and diseases modeling approaches and interactions among disciplines
- You will hear about methods used at different scales and levels of complexity
- One of our objectives this week is to **develop teams and strategies for intercomparing crop insect and disease models and approaches for their use in assessing production, economic impacts and adaptation at different scales**

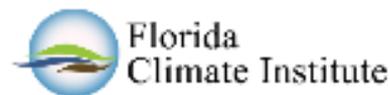
This Workshop

- Prior to coming to this workshop, we had suggestions from several participants on forming teams to compare different models and approaches for modeling P&D and their impacts on crops
 - Blight MIIP
 - Wheat FHB Disease MIP
 - Crop Health Modeling MIP
 - Economic Modeling of P&D Impacts
- You may have other suggestions for MIPs (e.g., for maize of other major crops and their pests and diseases)

ADVANCING PEST and DISEASE MODELING

FEBRUARY 23–25, 2015

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